

DECORATIVE DESIGNS OF ALASKAN NEEDLECASSES:
A STUDY IN THE HISTORY OF CONVENTIONAL DE-
SIGNS, BASED ON MATERIALS IN THE U. S. NATIONAL
MUSEUM.

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In 1877, Prof. F. W. Putnam^a described in detail the decorative designs found in the pottery of the Chiriqui Indians, and was the first, I believe, to propound clearly the theory that conventional designs develop from attempts at realistic representations, which gradually degenerate so that ultimately a purely conventional design remains, in which the realistic origin can hardly be recognized. Since that time this theory has been independently stated by a number of investigators, particularly by H. Stolpe^b and H. Balfour.^c It has been applied extensively to explanations of primitive designs. The most noteworthy contributions on this subject are those by Karl von den Steinen,^d on the art of the Brazilian Indians, and by A. C. Haddon,^e on the art of the natives of New Guinea.

Opposed to this view has been the theory propounded by Semper, who emphasizes the influence of material upon the development of the design, and that proposed by Cushing and Holmes,^f who emphasize the importance of technic upon the development of geometrical design. More recently Karl von den Steinen^g has also emphasized the importance of technical conditions upon the development of design, and his arguments have been followed and elaborated by Max Schmidt in discussions of South American designs. Th. Koch follows in the same line of argument, showing that at least in Brazil a consid-

^a Conventionalism in American Art, Bull. Essex Inst.

^b *Entwicklungserscheinungen in der Ornamentik der Naturvölker*, Mit. d. anthrop. Ges. in Wien, 1892, pp. 19 et seq.

^c *The Evolution of Decorative Art*, 1893.

^d *Unter den Naturvölkern Zentral-Brasiliens*, 1894, pp. 258 et seq.

^e *Evolution in Art*, 1895.

^f W. H. Holmes, *Textile Art in Relation to Form and Ornament*, Sixth Ann. Rep. Bur. Ethnol., 1884-85, p. 223.

^g *Correspondenzblatt der deutschen anthropologischen Gesellschaft*, 1905.

erable number of cases may be found in which designs that have developed from technical motives receive a realistic significance.

From a wider point of view, the secondary development of motives and their re-interpretation as realistic designs have been claimed by Heinrich Schurtz^a and by Professor Hamlin^b in a discussion of the development of architectural decorative designs. The secondary character of symbolic interpretation has also been set forth by A. L. Kroeber,^c Clark Wissler,^d and by myself.^e

We have therefore at the present time three distinct theories regarding the development of decorative design: First, the theory of the realistic origin of conventional motives; second, that of the technical origin of conventional motives; and, third, the theory that the explanations of conventional motives are essentially secondary in character, and due to a later association of the existing decorative forms with realistic forms.

I shall discuss in the following pages the decorative designs of Alaskan needlecases, largely from the region between the mouth of the Yukon River and the western part of Norton Sound, which seem to throw considerable light upon the history of decorative design, and illustrate the applicability of these various theories.

Among the carvings of Alaskan Eskimo we find a very large number of needlecases of peculiar form. They are of the characteristic tubular type of the Eskimo needlecase, in which the needle is inserted in a strip of skin pulled into a tube, which protects the needle against breakage. The peculiar type to which I here refer has, on the whole, a tube slightly bulging in the middle, and expanding into two wings or flanges at the upper end. It is characteristic of almost all these specimens that at a short distance below the flanges there are two small knobs on opposite sides of the tube. In some cases these are well marked, while in other cases they are so diminutive that they can not be seen at all, although they can be felt when moving the finger gently over the surface of the tube. They must be considered as one of the characteristic features of this type, which is so well defined, and whose distribution is so restricted that there can not be the slightest doubt as to the unity of its origin.

These needlecases have also a characteristic decoration. On the whole, there is a tendency to set off a slightly concave surface, which extends along the faces of the tube, between the flanges and farther down. This concave face may be observed on many of the needle-

^a *Urgeschichte der Kultur*, p. 540.

^b *The American Architect and Building News*, 1898.

^c *Decorative symbolism of the Arapaho*, *Am. Anthr.*, n. s. III, p. 329.

^d *Decorative Art of the Sioux Indians*, *Bull. Am. Mus. Nat. Hist.*, XVIII, 1904, pp. 231 et seq.

^e *The Decorative Art of the North American Indians*, *Pop. Science Monthly*, 1903, pp. 481 et seq.

cases shown on Plates XXII and XXIII (see Plate XXII, figs. 6, 7, 9, 10; Plate XXIII, figs. 1-4, 6, 8, 9, 11, 12). The flanges and the upper border of the tube are generally decorated by a design consisting of a number of parallel lines, which is repeated near the lower end of the flanges, where the parallel lines almost always slope slightly downward towards the tube. Similar line designs are also found on the concave face of the tube. In many cases these lines meet the lower lines on the flanges at an angle, being incised so that they slope downward from the middle line of the tube outward (Plate XXII, figs. 1-6). In other cases they continue in the same direction as the lines on the flanges (Plate XXII, figs. 7, 8; Plate XXIII, figs. 2-4, 6-12). Many of the needlecases are so much polished and rubbed off by use that the design lines can not be recognized distinctly. In other cases broken ends have been cut off (Plate XXII, fig. 7), with the result that the characteristic decorative traits have become obscure. It would seem, however, that in all the better specimens of this simple type the central concave face of the needlecase is set off more definitely by two parallel incised lines, which extend downward to about the middle of the tubing, and which end at this place in two or three small spurs (Plate XXII, figs. 4, 6, 7, 9, 10; Plate XXIII, figs. 2, 6, 8-12). The border design on the flanges is not continued over the space between the lines just referred to and the concave face of the tube. The parallel lines near the lower border of the flanges are also generally interrupted at this place. There is only a single specimen, among the simple needlecases, on which they run continuously (Plate XXIII, fig. 7).

Another characteristic decorative design of these needlecases is a narrow band extending around the lower end. This consists always, wherever it can be distinctly recognized, of two parallel lines with short alternating spurs directed toward the space between the two lines. Whenever these spurs are given a greater width this design assumes more or less the form of a zigzag band. A comparison of a considerable number of these designs shows clearly, however, that the primary idea is not the zigzag band, but rather the two lines with alternating spurs. This is best shown by the fact that in those cases where the lines are thin the alternation is often quite irregular. This may be observed, for instance, in the specimen shown on Plate XXII, fig. 2. On the whole, however, an alternation is observed. Bands of this kind may be recognized clearly on Plate XXII, figs. 3-6, 9, 10; Plate XXIII, figs. 6, 8-10. Sometimes the band at the lower end appears doubled, or elaborated by the addition of short vertical lines with short spurs at their ends (Plate XXII, fig. 9; Plate XXIII, figs. 11, 12; Plate XXIV, figs. 1, 2; Plate XXV, figs. 2, 3, 5, 6). These lines are four in number, except in the last three cases. In the specimen shown on Plate XXV,

fig. 5, two of these lines are absent, because their space is occupied by a long alternate-spur band which runs down the whole side of the needlecase. In the specimen shown in Plate XXV, fig. 6, one of them is absent, probably because the ivory at the place where it would be shows the soft inner part of the tusk, and has besides other defects. In Plate XXV, fig. 3, there is one of these lines on each side of the needlecase. In one specimen in the Royal Ethnographical Museum in Berlin the number of these lines is more than four (fig. 1).

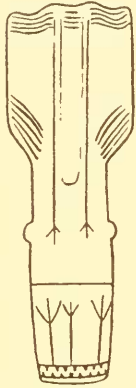


FIG. 1.—NEEDLECASE
(ROYAL ETHNOG.
MUS. BERLIN, NO.
IV A 5892).

A partial doubling of the spur band may be observed on Plate XXII, fig. 2; Plate XXIII, fig. 11; Plate XXV, figs. 3, 5, 7.

The features here enumerated comprise those of the most generalized type of these needlecases. They may be briefly summed up as (1) a tube slightly bulging in the middle, (2) flanges at the upper end, (3) small knobs under the flanges, (4) a long concave face at the upper end of the tube, (5) long parallel lines with small forks at their lower ends setting off the concave face, (6) border designs consisting of lines at the upper and lower ends of the flanges and on the concave face, and (7) an alternate-spur band at the lower end of the tube.

In order to understand the significance of this peculiar type of needlecase, we must bear in mind that the two design elements which are most characteristic of this specimen—namely, the line design with short branches and the alternate-spur design—are characteristic Eskimo motives over the greater part of the Arctic coast. The alternate-spur band design has been found by

me on a number of very old specimens from Southampton Island and Lyons Inlet, collected by Capt. G. Comer, which are reproduced here in fig. 2, *a* and *c*. In the same region the forked-line

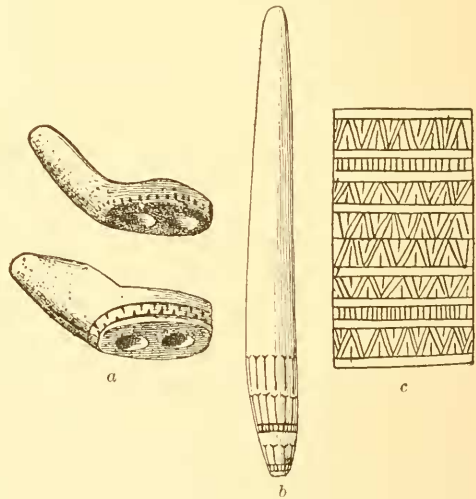


FIG. 2.—*a*, IVORY ATTACHMENT TO LINE, WEST COAST OF HUDSON BAY (AMER. MUS. NAT. HIST. NO. 8378); *b*, CREASER, IGLULIK (AMER. MUS. NAT. HIST. NO. 8152); FROM BOAS, ESKIMO OF BAFFIN LAND AND HUDSON BAY (BULLETIN AMER. MUS. NAT. HIST., XV, PP. 458, 459); *c*, DESIGN OF NEEDLECASE, KING WILLIAMS LAND (NO. 10405 U. S. N. M.).

design is found on bone engravings (fig. 2, *b*) and it may be observed in a few of the specimens found by Parry in Fury and Hecla Strait in 1820. Besides this, this design is commonly found in tattooings, the form of which is almost everywhere very stable. It occurs in the tattooings from the west coast of Hudson Bay, as well as in those from Baffin Land (fig. 3). Unfortunately I have not had opportunity to examine extensive collections from Greenland, in order

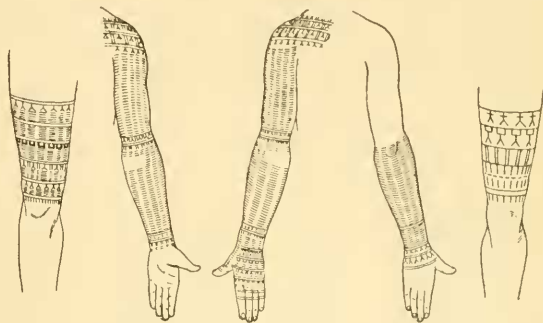


FIG. 3.—TATTOOINGS FROM THE WEST COAST OF HUDSON BAY AND FROM HUDSON STRAIT, FROM BOAS, ESKIMO OF BUFFIN LAND AND HUDSON BAY (BULL. AMER. MUS. NAT. HIST., XV, P. 473).

to ascertain the occurrence of these designs. In view of their wide distribution over the whole Eskimo area, it seems justifiable to consider them as a very old possession of the Eskimo, and to assume that originally they bore no relation to the needlecases on which they are found with such great regularity. Incidentally it may be remarked that the explanations of these forms as bushes and whales' tails, which are given by the Alaskan Eskimo, appear so one-sided that they can not be accepted as a general interpretation.



FIG. 4.—EAR-SPOON. NORTHERN KAM-CKATKA (AMER. MUS. NAT. HIST. NO. 7226). FROM W. JOCHELSON. THE KORYAK; JESUP NORTH PACIFIC EXPEDITION PUBLICATIONS, VI, P. 673.

It is important to note that the designs here mentioned do not seem to occur in parts of America or Asia which are outside of Eskimo influence. I have not been able to discover them on any objects of Indian manufacture except on a few specimens from the Yukon River made by Athapascan tribes directly under Eskimo influence. In Asia the same designs occur among the Koryak and Chukchee (fig. 4), while farther to the west and south I have not been able to find them. I am not certain whether the alternate-spur-line design does occur in the art of the Samoyed, but I have not discovered a single example in a large collection of Yakut specimens brought together by Mr. Jochelson; and it does not seem to occur among the Gilyak, Ainu, and southeastern

Tungus tribes. It seems that the design occurs occasionally in Polynesian and Micronesian art, but I should not venture to conclude from this an historical relation, notwithstanding the rather

large number of peculiar analogies between the northeast coast of the Pacific Ocean and the islands northeast of Australia.

Considering the continuous area in which the two designs occur, we may say that their essential home seems to be the Eskimo region, beginning with Alaska, and extending eastward and northeastward to Hudson Bay and Smith Sound, and that a few of the neighboring Indian tribes may have adopted them, and that they also occur among the neighboring Chukechee and Koryak.

One needlecase that has been found in the region of Southampton

Island seems to me of particular importance in this connection (fig. 5, *a*). It will be seen that this needlecase also consists of a tube, like most Eskimo needlecases; that it expands into wide flanges near its upper end, the whole tube being flattened; and that near the middle there are two large wings, which correspond in their position to the small knobs of the Alaskan needlecases. This specimen has also the characteristic alternate-spur band of the Alaskan needlecases at its upper end, and the decoration is repeated here in two parallel lines. Attention may be called to the occurrence of the same pattern at the same place in a number of the more complex specimens from Alaska, shown on Plate XXIV, figs. 2, 5, 8; Plate XXV, figs. 1-3, 7, 9;

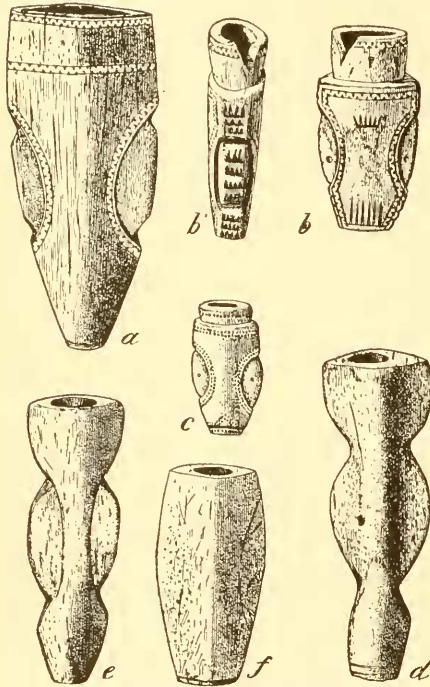


FIG. 5.—NEEDLECASES. FROZEN STRAIT EXCEPT *c* (PONDS BAY) AND *f* (AIVILIK) (AMER MUS. NAT. HIST. NOS. 5123, 5124, 5125, 5126, 5127, 5128). FROM BOAS, ESKIMO OF BAFFIN LAND AND HUDSON BAY (BULL. AMER. MUS. NAT. HIST., XV, P. 433).

Plate XXVI, fig. 4. These and other similar occurrences show that the Eskimo often substituted this design for the single parallel lines.

The alternate-spur-band design is related to the single spurred line, a pattern which is very common in many parts of the world. In the decorative art of the Eskimo it appears often in place of the alternate-spur band; for instance, on some needlecases of the type here discussed (see fig. 6; also Plate XXII, fig. 1; Plate XXV, fig. 4). In other cases the alternate-spur band is replaced by a ladder design

(Plate XXV, fig. 6), which, on account of its rarity, may be considered as a degenerate form of the alternate-spur band.

A group of needlecases similar to the one just described from Southampton Island has been found in the district between Southampton Island and Smith Sound. The only type of needlecase known from Smith Sound has this peculiar character. Unfortunately the specimens which I have seen are all exceedingly rough; but they all consist of a flattened tube, very wide at the upper end, and small and round at the lower end, provided at the sides with two characteristic wings (fig. 7).

The same type with some dot decorations has been collected at Ponds Bay in the northern part of Baffin Land (fig. 5, *c*), while the older specimens from the northern part of Hudson Bay are much more elongated, and have the wings and flanges set off more clearly from the body of the needlecase (fig. 5, *d*, *e*).

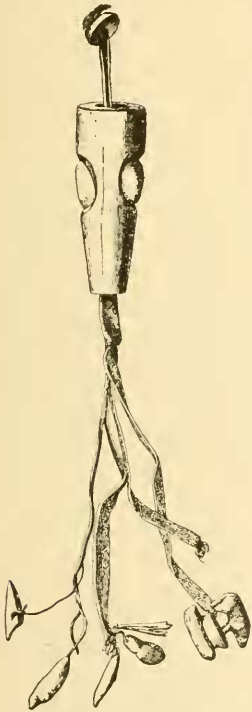


FIG. 7.—NEEDLECASE. SMITH SOUND (AMER. MUS. NAT. HIST. NO. 29⁰). FROM KROEBER, THE ESKIMO OF SMITH SOUND (BULL. AMER. MUS. NAT. HIST., XII, P. 287).

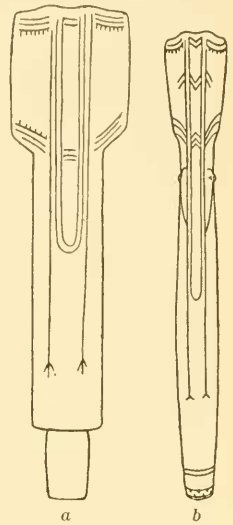


FIG. 6.—NEEDLECASES, (*a*, PEABODY MUS. AMER. ARCH., CAMBRIDGE, NO. 50264; *b*, ROYAL ETHNOL. MUS., BERLIN, NO. IV, A 3988).

It seems to me very plausible that the Alaskan type and the Eastern type represent specialized developments of the same older type of needlecase, and that the flanges and diminutive knobs of the Alaskan specimens are homologous to the flanges and large wings of the Eastern specimens. When the first specimens of this kind were collected, Prof. O. T. Mason, according to information which he has kindly given to me, was inclined to believe that they were of foreign origin. In a note on the specimen shown on Plate XXV, fig. 2, he wrote at that time:

This specimen is a needlecase from St. Michael, Alaska. It is made of walrus ivory and carved in

a form which suggests the butt end of an arrow, with two feathers projecting from opposite sides on the shaft. The likeness is made more striking by the fluting on the butt end, which resembles the nock of the arrow. A little in front of the two feathers are projecting bosses. The tube of the needlecase is slightly expanded in the middle and contracted at the smaller end. The

ornamentation consists of narrow bands across the shaft, and the feathers at their extremities cut out in zigzag line very much in the style of Polynesian ornamentation. At the smaller end there is also a similarly ornamented band from which rise four symbols of shrubs. An exactly similar piece is figured in Nordenskiöld^a and labeled "knife handle from Port Clarence." There are four of these objects in the U. S. National Museum, and, compared with hundreds of others, they place themselves unmistakably in the class of needlecases. There is no doubt that these six specimens—five in the U. S. National Museum and one shown by Nordenskiöld—are not aboriginal in form or ornament; that they belong to a style of art introduced into Alaska after the advent of the Russians.

In Seeböhm^b will be seen the figure of a Samoyed needlecase with a tube of metal, inclosed at its top in a belt, and riveted along the side. The suggestion is here thrown out that the Eskimo artist has endeavored to reproduce, in ivory, a facsimile of this metal tube and a portion of the leather belt, even to the projecting rivets. The Nordenskiöld specimen has, in addition, walrus heads and seals carved on the side of the tube.

This Polynesian style of ornamentation is common on hundreds of Eskimo objects in and about St. Michael; for, after the advent of the Russians and intercourse with sailors of the Pacific Ocean, the arts of the two areas became very much entangled.

Considering the antiquity of the eastern specimens, it does not seem plausible that the Alaskan specimens are a newly developed type. Their great frequency and the fixity of the type are also not in favor of this view.

It might perhaps also be argued that the knobs serve for firmly attaching the needlecase to a skin strap, but there is no evidence whatever that the needlecases were thus suspended. On the contrary, they seem to have been carried like all other Eskimo needlecases, by an attachment to the strip of skin into which the needles are inserted.

It seems certain, therefore, that the diminutive knob of the Alaskan needlecase serves no practical end whatever, and that it is a purely conventional feature in the form of the utensil. It is true that the large wings and flanges of the Eastern needlecases also serve no practical end; but it seems well to bear in mind the close resemblance of the two types.

It is important and interesting to compare the simple types heretofore described to a number of more complex needlecases which clearly belong to the same type.

It would seem that, first of all, the strong inclination of the Alaskan Eskimo to decorate carved objects by means of incised designs has led to further developments of the patterns heretofore described. Examples of this kind may be observed on Plates XXIV and XXV. In Plate XXIV, fig. 2, the same typical arrangement of flanges, knobs, and faces may be observed; but the concave face and vertical line are further decorated by oblique spurs placed in pairs, and the

^a Voyage of the Vega, London, II, 1881, p. 241.

^b Siberia in Asia, London, 1882, p. 56.

lower border design of the flange is elaborated into a single line with double oblique spurs also. On both sides of the needlecase, and surrounded by the line running downward along the lower border of the flange and on the body of the tube, is a design of what seems to be a human being with a caribou head, which stands on a line extending across the side of the needlecase, just over two knobs, the single knob on each side being doubled in this case. On the lowest point of the line surrounding the concave face stands a quadruped with long body and bent legs. Another type of elaboration and modification of the design is shown in Plate XXIV, fig. 1, where the lines with pairs of oblique spurs have also been made use of. The needlecases illustrated on Plate XXIV, figs. 3, 4, 6, are so much worn down that the designs have become very indistinct; but in these specimens, as well as in the one shown on the same plate, fig. 5, the middle concave face was never well marked. In the last-named specimen the border lines of the flanges are continued across the whole needlecase (compare Plate XXIII, fig. 7). While these specimens resemble in general shape the characteristic designs, the forms are rounded off, and have lost many of their decorative traits. On the reverse side of the specimen shown in Plate XXIV, fig. 4, a double line with oblique spurs running outward from the lines is shown, but not in the middle of the needlecase. Its position is so irregular that it can not be compared with the decorations of the specimens heretofore described. It will be observed that the same specimen has quite an irregular line decoration on the flanges. Plate XXIV, fig. 7, is a roughly finished specimen of the usual type. The concave face is hollowed out deeply, and the flanges are set off more markedly than in the majority of specimens. The knobs have been moved very far downward. This specimen seems to be modern and very roughly finished. Plate XXIV, fig. 8, also seems to be a modern specimen, in which the vertical border lines of the concave face have been moved toward the border of the flange, and where the upper border is replaced by an alternate-spur band. In this specimen the knobs are also moved very far downward. The specimen shown in fig. 9, Plate XXIV, resembles in many respects the one shown in fig. 7 of the same plate, particularly in the depth of the concave faces and in the sharp angle formed by the flanges where they are set off from the body of the tube.

Plate XXV, fig. 1, represents a specimen which is also presumably quite modern, and shows material deviations from the type. Here, instead of the middle concave face, we have a narrow flat surface with a single vertical forked line, the occurrence of which is obviously a survival of the older concave field with its two-forked border lines. On the sides of this needlecase, just under the flanges, is also a vertical forked line, which extends a little lower than the medial forked line. The knobs on the sides are very indistinct and marked only

by the sudden transition of the faces cut out under the flanges on each side into the tubular lower portion of the specimen. In Plate XXV, fig. 2, the border lines of the concave face consist of two forked lines on each side, and the border lines of the flanges have been transformed into alternate-spur bands. In fig. 4 of this plate the same lines are etched as spur bands, and the forked-line design is placed on the flanges. There is no indication of knobs. In the specimen shown in fig. 5 we find on the concave face of the tube an alternate-spur band added, which ends below, on the reverse and the obverse, with two parallel cross-lines. On the lower part of the flanges is shown, on one side a double alternate-spur band, while the opposite side is laid out on the same plan, with the only exception that the cross-lines between the lowest pair of border lines are drawn right across (as in the bands in Plate XXV, fig. 6). The whole side of this needlecase is flattened, beginning under the flange, down to the lower border. This flat field is occupied in its whole length by an alternate-spur band.

The bands in fig. 6, Plate XXV, are occupied by ladder designs instead of alternate-spur designs. Presumably this is the result of careless execution of the older spur design. Fig. 7 shows a very careful technic, and it is characterized by a strict adherence to the general type, extreme smallness of the knobs, and elaboration of the single decorative motives. Thus the upper border consists here of two alternate-spur bands; the lower border of the flanges of a number of parallel lines which are very close together. The same kind of lines occur on the middle field. The decorative band at the lower end is also doubled, and repeated at a short distance above the lower end.

Other modifications are found in the following specimens. In fig. 8 there is no middle concave face, but in its place we find two parallel lines which are carried down to the lower border. There are also two parallel lines on each side running down from the flanges to the lower border, and to the upper and lower border lines of the flanges are added vertical border lines, so that the whole flanges appear framed. The cross-section of this specimen is angular. In fig. 9 two parallel lines are substituted for the concave face, as in the specimen just described. The sides of this needlecase are also flat, while the back shows no vertical design and a rounded surface. Its only decoration consists of a continuous alternate-spur band design on top and at the lower end of the small flanges, continuing the corresponding bands on the front of the specimen and on the narrow sides of the flanges. This specimen has no indication of knobs.

Plate XXV, fig. 10, is in many respects peculiar, particularly in so far as the two small knobs are not on the same level. The middle concave field is carried down to the lower end of the needlecase, as in the two preceding cases, and the whole needlecase is angular in cross-section. It has eight faces, which taper down toward the

lower end. On the three faces on the right-hand side is the small double-angle decoration which has been indicated in our illustration. A double angle turned with its apex downward is also found on the lateral face on the right-hand side. As shown in the illustration, the flanges do not extend up to the top of the needlecase, as is the case in most specimens.

The needlecase represented in Plate XXV, fig. 11, illustrates a very peculiar reduction in the general form. The flanges have almost disappeared, and with them the upper and lower decorative border, as well as the border at the lower end of the tube; and all that remains to remind us of the form here discussed are four parallel forked lines, which, however, are continued beyond the forks. Nevertheless the impression given by the specimen in connection with the whole series is such that I do not doubt for a moment that it belonged originally to the series under discussion.

The series represented on Plates XXVI–XXVIII seems to me of special importance, and interesting from a theoretical point of view. The identity of the types of needlecases here shown and the preceding ones is perfectly obvious. The specimens collected on Plate XXVI show with perfect distinctness the bulging tube, the flange with its decoration, the knobs, and the concave face of the tube. Here part of the specimen seems to be conceived of as an animal. The bulging tube is the body of the animal, whose head has been added at the lower end of the tube. Although the transformation of the lower end of the needlecase into an animal has been perfected, it does not seem likely that the whole object was conceived as an animal form. If this were the case, the flanges, when transformed into the tail of a sea mammal, would probably have been modified, and the position of the head would be so changed as to be in proper relation to the tail.

It seems to my mind entirely artificial to assume that in this case the animal form as such could possibly have preceded the typical needlecase as before described, but that we are dealing here evidently with a secondary interpretation of the design, which finds expression in the addition of the animal head and in other later additions to the whole form. In Plate XXVI, figs. 2, 3, 5, 6, and 7, the entire old design may be recognized in all its details; even the alternate-spur band remains, although it interferes with the form of the seal's head which has been added. In fig. 3 the head of the animal has been turned, so that the lower part of the needlecase looks like a sea animal swimming on its back. A similar specimen from the Royal Ethnographical Museum in Berlin is shown in fig. 8. It has a unilateral small knob. In fig. 1 of Plate XXVI we find what may be a still further development of the original design here described. The seal's head has disappeared again, and in its place we find a simple knob. There are three parallel lines near the lower end of this knob,

which make the whole area, seen from the top, look a little like a small crustacean. The knobs in this specimen are very small. I consider it quite possible that here we may have a case where, under the stress of older forms of the needlecases, a partial reversion to the original type has taken place.

The strong tendency of the Eskimo to utilize animal motives has found expression in another manner in the specimen represented in Plate XXVI, fig. 4. Here the small lateral knobs have been considerably enlarged and have been given the form of seals' heads (see also p. 333). I believe that here also there can be no doubt in regard to the question whether the seal's head or the knobs are older. If the knob had to be considered as a degenerate form of the seal's head, it would



FIG. 8.—NEEDLE-CASE (ROYAL ETHNOG. MUS., BERLIN, No. IV A 3987).

hardly be intelligible why only one or two specimens out of a great number should retain the heads in this place, while in practically all other cases the reduction to a simple knob, sometimes so small that it can hardly be felt, should have occurred. It seems quite evident that in this case the imagination of the artist was stimulated by the traditional knob, and that it has been developed, owing to a desire to further decorate the utensil, into seals' heads. The modification of the central concave face of this specimen is quite in accord with other modifications of the same surface, which have been described before. On the reverse of this needlecase the pairs of oblique spurs attached to the converging lines are directed toward the upper part of the needlecase.

On Plates XXVII and XXVIII a number of specimens have been collected, in which another part of the needlecase has been modified through the general tendency of the Eskimo artists to introduce animal designs. Instead of the lower end, the flange has been thus developed. The procedure appears perhaps clearest in the specimen shown in Plate XXVII, fig. 3, where on one side the flange shows a number of perforations and modifications, by means of which it has been developed into a quadruped, while on the other side a walrus head has been developed by making a long slit along the body of the tube and by inserting an eye, the lines indicating nostrils and mouth, near the upper border. Thus the outer sides of the flanges form the tusks of the walrus head, while the top forms the head itself. The specimen here referred to shows clearly its close relation to the original type of needlecase. The decoration of the lower part, and the concave face, may still be observed. The characteristic decorations of the concave face are also indicated. In figs. 1, 5, and 6 of the same plate we find the same type of needlecase with a

double walrus head at the top. It would seem that in most of the specimens the tusks have been broken off. In fig. 5 the small knobs under the lower end of the tusks may be observed quite distinctly. In this specimen traces of the vertical forked lines bordering the middle field also remain. In these three specimens the middle concave face is quite distinct. In figs. 2 and 4 of the same plate two specimens are represented which combine a modification of the lower end of the needlecase with that of the upper end. At the lower end a seal head is represented at one side, as in the specimens previously discussed, while in the upper end the double walrus head is found. In these specimens also the middle concave face is well marked, although in fig. 4 it is not bordered by an incised line.

The next group of modifications of the old type of needlecase follows out the same direction as those just described, the flanges being modified so as to represent an animal on each side. A specimen of this type is shown in fig. 9, where a walrus with head stretched forward is shown. The tusks touch the upper end of the tube, while the two flippers are shown at the lower end.



FIG. 9.—NEEDLECASE (ROYAL ETHNOG. MUS., BERLIN, No. IV. A 5491).

Two seals are shown in the same position in fig. 10 and on Plate XXVIII, fig. 7, while two quadrupeds occupy the position of the flanges in figs. 1 and 6 of Plate XXVIII. In fig. 4 of the same plate the quadrupeds appear doubled; and in fig. 8 the seals have so much increased in size that they occupy the whole side of the needlecase. However, in this case also, the close relation between all these types can easily be demonstrated by an examination of Plate XXVIII, figs. 4 and 7, which retain all the characteristic traits of the simple type. The two animals in fig. 6 of this plate seem to represent lemmings. They are placed somewhat differently from the ordinary form of the flanges, but are evidently developed from forms like these shown in figs. 1 and 7 of this plate. A specimen in which the one side of the needlecase retains the ordinary shape, while the opposite side of the flange has been transformed into an animal, is represented on Plate XXVI, fig. 8.

In this case also it would seem exceedingly difficult to interpret the simple geometrical form of the needlecase as a later development from the animal representations here discussed. In this case, similarities of the decorative designs on the tubings would be entirely unintelligible, while the assumption that the animal forms have developed from the geomet-



FIG. 10.—NEEDLECASE (ROYAL ETHNOG. MUS., BERLIN, No. IV. A 2991).

rical forms seems to give a very plausible explanation of the forms of these specimens.

The specimens in which the upper end has been so modified as to become a double walrus head lead us to another group in which the walrus head is repeated a number of times along the sides of the tube. Specimens of this kind are represented on Plate XXVIII, figs. 2 and 3. In both of these traces of the old upper and lower border decoration remain, and fig. 3 also shows the typical oblique spurs in pairs in the same position which has been described several times. It therefore seems perfectly natural to interpret figs. 2 and 3 as the result of repetitions of the animal design, which was first developed from the flanges of the old needlecase. Figs. 3 and 5 differ from other specimens of their kind in that they have the walrus head developed only on one side, while on the opposite side the flange is suppressed.

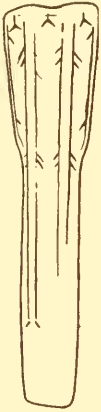


FIG. 11.—NEEDLECASE (ROYAL ETHNOG. MUS., BERLIN, NO. IV A 3992).

As has been indicated, the geometrical decorations of the typical flanged needlecases reappear in many of these highly modified specimens. Attention may also be called to the forked-line designs which rise from the lower border in the usual number in the specimens shown in figs. 4, 6 and 7 of this plate. In fig. 7 the number of these lines is five. The specimen, however, is very crude and quite modern, and the deviation in number may be due to inaccuracy in laying out the ornament. In fig. 4 there are two forked designs on opposite sides, while from the tails of the animals down to the lower border runs an alternate-spur band. Between the alternate spur-bands and the long forked lines there are short forked lines, as indicated in the illustration. Only in fig. 8 do we find an important modification of the lower end of the needlecase, which

forms a ring. That in our specimen has been broken. The backs of the two needlecases shown in figs. 3 and 5 are somewhat flat. It is of interest to compare the line decoration of the latter needlecase with the one shown in fig. 11, which is a simple modification of the fundamental type.

The illustrations, figs. 1 and 2 on Plate XXIX, of two needlecases in human form, are not quite as convincing as the specimens themselves; but a comparison of these forms with the other needlecases of this series seems to me to suggest with great force that the human figures here shown are related to the same type of needlecase that we are discussing here. The whole human figure is treated as a tube, and it is my opinion that the bulging hips correspond to the bulging middle part of the needlecase, while the arms correspond to the flanges, and perhaps more particularly to developments of the flanges

similar to the walrus-head developments, while the head is a later development of the upper border, suggested by the perception of the similarity of the whole form to a human figure. I do not wish to imply that the human figure in this case has necessarily developed from the type of needlecase first discussed; but it seems plausible to me that an assimilation between the human figure and this type has taken place in the two specimens here illustrated. It seems likely that the animal figure shown in fig. 12 must be considered in a similar manner. There is no doubt that the vivid representation of the animal lying down has very little to do with our type of needlecase; but nevertheless I can not free myself from the impression that the artist, in his treatment of the subject, has been influenced by the treatment of the flanges of needlecases and by the general form of this utensil. There is a certain similarity between the position of the feet and the positions of the walrus tusks shown on Plates XXVII and XXVIII, which is not explained by a realistic treatment of the animal alone; and the same is true of the position of the neck and head and of the curves in the hind part of the body.

The similarities which I am discussing here are even less clear in some of the other specimens represented on Plate XXIX. Fig. 3 of this plate evidently represents a human leg, the design on one side being a representation of tattooing. In this case faint traces of the upper border design and of the lower border design remain, and the outline of the whole specimen still recalls to a certain extent the bulging tube below and the wider part with its flanges above. If we agree to consider this specimen as belonging to the present series, the specimen shown in fig. 5 must be considered as belonging here also. There is no doubt that fig. 4 of this plate belongs to our series. The tube and the knobs are the same as those occurring in the most typical specimens. Instead of the concave faces, we have merely flat surfaces, and the flanges have been much reduced in size, but are perfectly distinct and sharply set off. The ornamentation, however, differs on the flanges and concave faces from the ordinary decoration. Besides the designs shown in the illustration, we have, on the back of the flange to the right, a line with two pairs of one-sided oblique spurs running downward and a forked line running down from the black ring, like the one shown on the right-hand side of the illustration. On the right-hand side of the lower part of the needlecase an etched design, representing a quadruped with long tail, will be observed. Fig. 6, Plate XXIX, shows a simple tube with four groups of knobs, which may have been suggested by the knobs of the specimens here described. Figs. 7 and 8, Plate XXIX,



FIG. 12.—NEEDLECASE (No. 33619)
ST. MICHAELS.
E. W. NELSON.

represent a needlecase, which on one side shows the typical form of the flanged specimens, while on the opposite side the head, neck, and forepaws of an animal are set off.

Another geometrical development of the ordinary type is represented in fig. 13. In this specimen the general outline of the flanged tube is readily recognized, but all the other characteristic features have disappeared.

On Plate XXX five specimens are illustrated whose relation to the flanged type is very doubtful. The knobs in fig. 1 of this plate, which are doubled in the axial direction and appear on four sides of the tube, are analogous to those shown in fig. 6 of Plate XXIX; and these two types are undoubtedly closely related. Attention may be called to the awl-like implement illustrated in fig. 14, which shows the

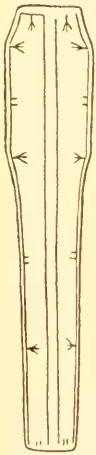


FIG. 13.—NEEDLECASE (PEABODY MUS. AMER. ARCH., CAMBRIDGE, MASS., No. 146.)



FIG. 14.—AWL (No. 43837) UNALAKLEET, NORTON ISLAND, E. W. NELSON.

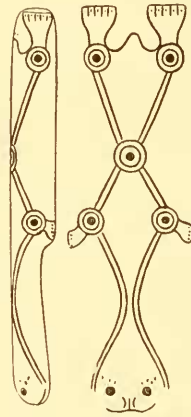


FIG. 15.—NEEDLECASE (ROYAL ETHNOG. MUS., BERLIN, No. IV A 3986).

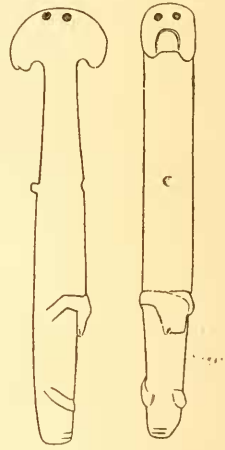


FIG. 16.—NEEDLECASE (ROYAL ETHNOG. MUS., BERLIN, No. IV 3985).

same four knobs here described, and which therefore in its origin may well be related to the decorative designs on the needlecases. The animal types on Plate XXX, figs. 2-6 and in fig. 15, diverge so much from the flanged type that their relationship seems very doubtful. Still I can not free myself from the impression of a certain influence of the flanged types upon these forms also. This becomes apparent by a comparison of the needlecase shown in fig. 16 with the animal types here discussed. It is quite evident that this specimen has its affiliations both with the animal types and the walrus-head types shown on Plate XXVII. It is, however, also possible that its form has originated by assimilation of two distinct types.

The conclusion which I draw from a comparison of the types of needlecases here represented is that the flanged needlecase represents

an old conventional style, which is ever present in the mind of the Eskimo artist who sets about to carve a needlecase. The various parts of the flanged needlecase excite the imagination of the artist; and a geometrical element here or there is developed by him, in accordance with the general tendencies of Eskimo art, into the representation of whole animals or of parts of animals. In this manner small knobs or the flanges are developed into heads or animals. After this modification has once set in, the animal figures may be repeated in other parts of the implement. Besides this, associations between animal forms and the form of the whole needlecase seem to have taken place, which have to a certain extent modified the manner of representing animals which were adapted to use as needlecases; so that the old form and style of the needlecase determined the treatment of the animal form.

If we were to apply to the present series the theory of the origin of conventional form from realistic motives, it would be exceedingly difficult to account for the general uniformity of fundamental type. It seems to me that, on the basis of this theory, we could not account for the diversity of realistic forms and the uniformity of general type. Neither does it seem possible to account for the series of types by assumption of any influence of technic; and my impression is that the only satisfactory explanation lies in the assumption that the multifarious forms are due to the play of the imagination with a fixed old conventional form, the origin of which remains entirely obscure. This I freely acknowledge. If, however, we are to form an acceptable theory of the origin of decorative designs, it seems a safer method to form our judgment based on examples the history of which can be traced with a fair degree of certainty, rather than on speculations in regard to the origin of remote forms for the development of which no data are available.

I believe a considerable amount of other evidence can be brought forward sustaining the point of view that I have tried to develop, namely, that decorative forms may be largely explained as results of the play of the imagination under the restricting influence of a fixed conventional style. Looking at this matter from a purely theoretical point of view, it is quite obvious that in any series in which we have at one end a realistic figure and at the other end a conventional figure, the arrangement is due entirely to our judgment regarding similarities. If, without further proof, we interpret such a series as a genetic series, we simply substitute for the classificatory principle which has guided us in the arrangement of the series a new principle which has nothing to do with the principle of our classification. No proof whatever can be given that the series selected according to similarities really represents an historical sequence. It is just as conceivable that the same series may begin at the conventional end and that realistic forms have been read into it, and we might

interpret the series, therefore, as an historical series beginning at the opposite end. Since both of these tendencies are active in the human mind at the present time, it seems much more likely that both processes have been at work constantly, and that neither the one nor the other theory really represents the historical development of decorative design.

The assumption of a development from realistic design to conventional design also omits the consideration of one exceedingly important element, namely, the style of convention that prevails in the types of art of different areas. If geometrical designs developed from realistic motives the world over, it still would remain to be proved why a certain style of conventionalism belongs to one art and another style to another art; and in order to explain in a satisfactory way the different styles of art, we should have to accept these as given at a very early stage during the process of conventionalization of realistic designs.

The attempt to explain the processes of conventionalization by the theory of the influence of technical motives does not seem to offer an entirely adequate solution of this problem. It is true that certain very simple designs seem to be due almost entirely to the influence of technic upon simple decorative tendencies. This influence, however, does not reach so far as to determine in detail the character of design in the same kind of material or in the same technic. As an example of such differences may be mentioned, for instance, the designs in woven checkered mattings from West Africa, where peculiar realistic figures alternate with geometrical band designs; the designs of cedar-bark mattings of the Ojibwa and of those of the North Pacific coast, and of designs made in the same technic by the South American Indians. In all these cases the technical conditions are practically the same, but the styles differ vastly. It seems necessary, therefore, to assume in the development of design the existence of tendencies which are due to causes different from the technic, and unrelated to the realistic motives which may be current or may have been current.

I have no theory to offer in regard to the origin of these types of convention, which presumably was connected with a whole series of activities determining the perception and reproduction of forms; but it seems desirable to point out by a number of instances the fixity of these conventional forms and the deep influence that they have had even in apparently realistic forms. I have pointed out in the discussion of the designs of the blankets of the Chilkat Indians that a great many of the older forms can be reduced to two fundamental types, and that, no matter what animal may be represented in the art of the weaver, it is almost always reduced to one of these two forms.^a In

^a G. T. Emmons, *The Chilkat Blanket*, *Memoirs, Amer. Mus. Nat. Hist.*, III, p. 355.

the same place I have shown that the treatment of the animal figure on carved boxes of the Tlingit has other fixed conventional forms, which, although closely related to the blanket design, are quite permanent and applied only in the manufacture of boxes.^a

In a quite different region, among the Tungus tribes of the Amur River, Dr. Berthold Laufer has shown that one of the essential types determining the whole arrangement of decorative designs, which consist of realistic figures as well as of curved lines, is based on the type of "cocks combatant."^b

It is also important to note that figures conforming to such fundamental types may be interpreted in a great variety of ways by the people who use them. I have pointed out such a similarity of type and fundamental difference of interpretation in explanations given by the Huichol Indians.^c Here we find practically the same figure once interpreted as the fresh-water crab, and then as oak leaves and stems. Other more extended series of such ambiguous interpretations may be found in the art of the Plains Indians as well as in those of other parts of the world.^d

I have suggested before that in many cases these forms seem to compel us to assume that the interpretations of many simple forms are entirely secondary; that often the forms have been borrowed; and that later on, according to their use in the life of the people, they have been given a fitting interpretation.^e

I think evidence can be brought forward also to show that the tendency to play, and the play of the imagination with existing forms, have deeply influenced the decorative art of primitive tribes as we find it at the present time.

The first of these traits appears with particular clearness in the tendency to use rhythmic repetitions of varying forms. Bead necklaces are one of the most striking examples of the pleasure that man receives through the use of rhythmic repetition of colors and forms. It is very important to notice that among primitive tribes the rhythmic and symmetrical order of such arrangements are often exceedingly complex,—so complex, in fact, that they can be recognized by us only by a close study of the arrangement. A case of this kind occurs in the fringe on a pair of leggings collected among the Thompson Indians, which I have described.^f In this specimen we have a fringe which

^a G. T. Emmons, *The Chilkat Blanket*, *Memoirs, Amer. Mus. Nat. Hist.*, III, pp. 357 et seq.

^b *Publications of the Jesup North Pacific Expedition*, IV, pp. 22 et seq.

^c Carl Lumholtz, *Decorative Art of the Huichol Indians*, *Memoirs, Amer. Mus. Nat. Hist.*, III, p. 287 and figs. 451 and 465.

^d A. L. Kroeber, *The Arapaho*, and Clark Wissler, *Decorative Art of the Sioux Indians*, *Bull. Amer. Mus. Nat. Hist.*, XVIII.

^e Franz Boas, *The Decorative Art of the North American Indians*, *Popular Science Monthly*, LXIII.

^f *Publications of the Jesup North Pacific Expedition*, I, p. 384, fig. 313.

hangs down in a very disorderly fashion, so that the constituent elements can not be seen distinctly. Nevertheless a most painstaking arrangement of the component elements is adhered to, the rhythmic unit consisting of five elements,—one string having one glass bead and two bone beads in alternating order, one undecorated string, one having alternating glass and bone beads, one undecorated, and one having one glass bead and two bone beads in alternating order. I have found still more complex rhythmic repetitions and symmetrical arrangements on the embroidered borders of coats of the Koryak. These contained sometimes ten and more elements in one group.^a Still another case of similar kind, from Peru, has been described by Mr. Mead.^b Here a rhythmic repetition of six units seems to be very common.

I consider it particularly important to observe that in the first of these specimens the rhythmic repetition can not be seen when the leggings are in use, because this suggests strongly that the reason for the application of the rhythmic repetition is not the æsthetic pleasure in the effect which it produces, but the pleasure felt by the maker. If this is true, then we do not need to assume that in the other cases a much more highly developed appreciation of complex rhythm is found among primitive people than the one we possess. Corroborative evidence in regard to this point is offered by the basketry of the Thompson and Lillooet Indians. I have noticed that here, where in a fine imbricated technique color bands are produced, the basket weavers tend to use with great regularity certain groupings of the number of stitches belonging to each color, although, owing to the irregularity of the size of the stitches, these modifications can hardly be observed.^c If these facts have a wider application, it would seem that on the whole the pleasure given by much of the decorative work of primitive people must not be looked for in the beauty of the finished product, but rather in the enjoyment which the maker feels at his own cleverness in playing with the technical elements that he is using. In other words, one of the most important sources in the development of primitive decorative art is analogous to the pleasure that is given by the achievements of the virtuoso.

Examples may also be given illustrating the effect of the play of imagination upon the development of design. One of the best examples of this kind is offered by the decorated bag of the Thompson Indians illustrated by Professor Farrand.^d The analogy of this soft rectangular bag, which is decorated with rows of large dia-

^a Publications of the Jesup North Pacific Expedition, VI, pp. 689 et seq.

^b Boas Anniversary Volume, pp. 193 et seq.

^c Publications of the Jesup North Pacific Expedition, II, p. 206.

^d *Idem*, I, pl. xxxiii, fig. 1.

monds, to other similar bags shows quite clearly that the rows of diamonds have the same origin as the rows of diamonds which are painted on parfleches of the Plains Indians. In this case the diamonds suggested the idea of ponds; and, in order to emphasize this idea, which came to the mind of the woman who used the bag, she added a number of birds flying toward these ponds. Other examples of this kind have been mentioned by Doctor Koch in his observations on the drawings of South American Indians. The development of the triangles in the designs of the Plains Indians to tent designs or cloud designs brings out similar points.

Thus it would seem that the development of decorative designs can not be simply interpreted by the assumption of a general tendency toward conventionalism or by the theory of an evolution of technical motives into realistic motives by a process of reading in, but that a considerable number of other psychic processes must be taken into consideration if we desire to obtain a clear insight into the history of art.

EXPLANATION OF PLATES.

PLATE XXII.—NEEDLECASES.

- FIG. 1. Ancient specimen from the mouth of the Yukon River, Alaska. Cat. No. 38758, U.S.N.M.
2. From Razboinski, a village on the Lower Yukon River, Alaska. E. W. Nelson, collector. Cat. No. 48802, U.S.N.M.
 3. From Cape Darby, Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 44172, U.S.N.M.
 4. From Kwikpak, Lower Yukon River, Alaska. E. W. Nelson, collector. Cat. No. 38096, U.S.N.M.
 5. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24490, U.S.N.M.
 6. From Paimut, Kuskokwim River, Alaska. E. W. Nelson, collector. Cat. No. 38362, U.S.N.M.
 7. Upper part of a needlecase. From Mission, Lower Yukon River, Alaska. E. W. Nelson, collector. Original number, 4249, U.S.N.M.
 8. From Razboinski, Lower Yukon River, Alaska. E. W. Nelson, collector. Cat. No. 48801, U.S.N.M.
 9. From St. Michael, Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 33700, U.S.N.M.
 10. From Pimiktalik, a village south of St. Michael, Alaska. E. W. Nelson, collector. Cat. No. 33695, U.S.N.M.

PLATE XXIII.—NEEDLECASES.

- FIG. 1. From Razboinski, Lower Yukon River, Alaska. E. W. Nelson, collector. Cat. No. 48806, U.S.N.M.
2. From Razboinski, Lower Yukon River, Alaska. E. W. Nelson, collector. Cat. No. 48812, U.S.N.M.
 3. From St. Michael, Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 33694, U.S.N.M.

- FIG. 4. From Sledge Island, west of Cape Nome, Alaska. E. W. Nelson, collector. Cat. No. 4474, U.S.N.M.
5. From Razboinski, Lower Yukon River, Alaska. E. W. Nelson, collector. Cat. No. 48811, U.S.N.M.
6. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24495, U.S.N.M.
7. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24470, U.S.N.M.
8. From Kaviag, near Port Clarence, Alaska. E. W. Nelson, collector. Cat. No. 33703, U.S.N.M.
9. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24476, U.S.N.M.
10. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24477, U.S.N.M.
11. From Cape Nome, Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 176290, U.S.N.M.
12. From Pikmiktalik, south of St. Michael, Alaska. E. W. Nelson, collector. Cat. No. 33702, U.S.N.M.

PLATE XXIV.—NEEDLECASES.

- FIG. 1. From Kwikpak, Lower Yukon River, Alaska. E. W. Nelson, collector. Original number, 3972, U.S.N.M.
2. From Cape Darby, Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 44171, U.S.N.M.
3. Western Alaska. J. Henry Turner, collector. Cat. No. 153830, U.S.N.M.
4. From Kotzebue Sound, Alaska. E. W. Nelson, collector. Cat. No. 48569, U.S.N.M.
5. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 129293, U.S.N.M.
6. From Kaviag, near Port Clarence, Alaska. E. W. Nelson, collector. Cat. No. 33693, U.S.N.M.
7. From Kaviag, near Port Clarence, Alaska. E. W. Nelson, collector. Cat. No. 33697, U.S.N.M.
8. From Kaviag, near Port Clarence, Alaska. E. W. Nelson, collector. Cat. No. 33699, U.S.N.M.
9. From Cape Nome, Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 45338, U.S.N.M.
10. From Cape Nome, Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 176289, U.S.N.M.

PLATE XXV.—NEEDLECASES.

- FIG. 1. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 176289, U.S.N.M.
2. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 129239, U.S.N.M.
3. From Shaktolik, eastern part of Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 39094, U.S.N.M.
4. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24466, U.S.N.M.
5. From mouth of Yukon River, Alaska. E. W. Nelson collector. Cat. No. 38758, U.S.N.M.
6. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24483, U.S.N.M.

- FIG. 7. From Unalaklik, eastern shore of Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 33696, U.S.N.M.
8. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24494, U.S.N.M.
9. From Sledge Island, west of Cape Nome, Alaska. E. W. Nelson, collector. Cat. No. 44732, U.S.N.M.
10. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24484, U.S.N.M.
11. From Ooglamie, Point Barrow, Alaska. P. H. Ray, collector. Cat. No. 56575, U.S.N.M.

PLATE XXVI.—NEEDLECASES.

- FIG. 1. Peabody Museum, Cambridge, Mass. Cat. No. 63563.
2. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24487, U.S.N.M.
3. From Lower Yukon, Alaska. E. W. Nelson, collector. Cat. No. 33698, U.S.N.M.
4. From Cape Nome, Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 176230, U.S.N.M.
5. From Paimute, Kuskokwim River, Alaska. E. W. Nelson, collector. Cat. No. 37150, U.S.N.M.
6. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24473, U.S.N.M.
7. From Razboinski, on the Lower Yukon River, Alaska. E. W. Nelson, collector. Cat. No. 48860, U.S.N.M.
8. From Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24469, U.S.N.M.

PLATE XXVII.—NEEDLECASES.

- FIG. 1. From the Lower Yukon River, Alaska. E. W. Nelson, collector. Cat. No. 38363, U.S.N.M.
2. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24488, U.S.N.M.
3. From St. Michael, Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 43792, U.S.N.M.
4. From Lower Yukon River, Alaska. E. W. Nelson, collector. Cat. No. 38448, U.S.N.M.
5. From Razboinski, on the Lower Yukon River, Alaska. E. W. Nelson, collector. Cat. No. 48817, U.S.N.M.
6. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24465, U.S.N.M.

PLATE XXVIII.—NEEDLECASES.

- FIG. 1. From Sledge Island, west of Cape Nome, Alaska. E. W. Nelson, collector. Cat. No. 44731, U.S.N.M.
2. From Nubviakchukaluk, Alaska. E. W. Nelson, collector. Cat. No. 43942, U.S.N.M.
3. From western Alaska. J. Henry Turner, collector. Cat. No. 153832, U.S.N.M.
4. From western Alaska. J. Henry Turner, collector. Cat. No. 153831, U.S.N.M.
5. From Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 33615, U.S.N.M.

- FIG. 6. From Hotham Inlet, east of Kotzebue Sound, Alaska. E. W. Nelson, collector. Cat. No. 64164, U.S.N.M.
7. From Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 24468, U.S.N.M.
8. From Sledge Island, west of Cape Nome, Alaska. E. W. Nelson, collector. Cat. No. 45168, U.S.N.M.

PLATE XXIX.—NEEDLECASES.

- FIG. 1. From the Lower Yukon, Alaska. E. W. Nelson, collector. Cat. No. 38364, U.S.N.M.
2. From Alaska. E. W. Nelson, collector. Cat. No. 43945, U.S.N.M.
3. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. 129219, U.S.N.M.
4. From Alaska. Lucien M. Turner, collector. Cat. No. 24493, U.S.N.M.
5. From Razboinski, on Lower Yukon River, Alaska. E. W. Nelson, collector. Cat. No. 48815, U.S.N.M.
6. From Koyuk River, Norton Sound, Alaska. E. W. Nelson, collector. Cat. No. 44069, U.S.N.M.
- 7 and 8. From Alaska. Lucien M. Turner, collector. Cat. No. 24467, U.S.N.M.

PLATE XXX.—NEEDLECASES.

- FIG. 1. From Sledge Island, west of Cape Nome, Alaska. E. W. Nelson, collector. Cat. No. 55167, U.S.N.M.
- 2 and 3. From St. Michael, Alaska. Lucien M. Turner, collector. Cat. No. 129229, U.S.N.M.
4. From Togiak River, north of Bristol Bay, Alaska. I. Applegate, collector. Cat. No. 127443, U.S.N.M.
5. From Nunivak Island, eastern shore of Bering Sea, Alaska. E. W. Nelson, collector. Cat. No. 43699, U.S.N.M.
6. From St. Michael, Norton Sound, Alaska. Lucien M. Turner, collector. Cat. No. U.S.N.M. unknown.